ON SOME LAND SHELLS COLLECTED IN QUEENSLAND, BY MR. SIDNEY W. JACKSON.

By C. Hedley, F.L.S.

(Plates iv.-x.)

Primarily in quest of ornithological material and information and on behalf of Mr. H. L. White, of Belltrees, Scone, New South Wales, Mr. Sidney W. Jackson visited Queensland in 1908. His travels extended through the coastal area, from Brisbane in the south, to Cairns in the north. Some account of his successful journey in search of the Tooth-billed Bower Bird was published in the "Emu."*

No other part of the continent has so rich a snail fauna as this. Some of the districts travelled by our naturalist had not been searched previously by a conchologist. No opportunity was lost of collecting land-shells, only a few of the large collection gathered, being discussed in the following pages. Among the first fruits which he reaped as a pioneer in new country, are the interesting *Panda* discovered near Mackay, and the curious *Planispira* taken near Atherton. Besides such novelties, the collection affords interesting information on the extension inland of species hitherto considered to be confined to the coast.

An unusual and pleasing feature of this collection is not only the care with which the specimens have been collected and preserved, but the sketches and excellent field-notes on habit and environment. Seldom do collectors pay such attention to these important details.

My cordial thanks for the privilege of studying this interesting collection are offered to Mr. Jackson, who has further added to my obligations by presenting the types of the new species here described to the Australian Museum.

*Jackson, "The Emu," viii., 1909, pp.233-285; *Id.*, x., 1910, pp.81-88.

PANDA WHITEI, sp.nov.

(Plate iv., figs.1, 2, 3, 4.)

Shell small for the genus, imperforate, thin, translucent, broadly auriform, spire short. Colour: on a tawny olive ground are spiral lines of chocolate, varying from five to eight, irregularly broken into dashes, between the lines are numerous chocolate specks. The nuclear shell is set with minute grains in radial and spiral lines, after a whorl and a half it terminates abruptly at a furrow. The adult shell is only a whorl and an eighth, its smoothness is scarcely broken by faint, radial growth-lines. Aperture very oblique, oblong, its margins connected by a film of callus. Behind this and running in a spiral along the columella is a sharp-edged callus-ridge. A faint purple glaze extends over the interior. Height, 23; diameter, 18 mm.

Several living specimens, under damp logs in dense scrub on the mountain side, near Finch Hatton Creek, a branch of the Pioneer River, Port Mackay (August, 1908).

Mr. Jackson prepared a drawing of the extended animal from life, which is here reproduced (Plate iv., fig.4). He noted that the animal bore a general resemblance to *P. larreyi* and *P. falconeri*. Even when retracted, it is too large to be contained in the shell. Median area of the tail deeply excavate; from a tapering longitudinal furrow, grooves branching in pairs descend to the margin. Sides of the foot spreading in a broad flange. Except the dorsal furrow, which is smooth, the upper surface is tuberculate, the tubercles on the neck being larger and more elongate than those on the side. The upper surface of the animal is mostly a dull brown, the tentacles reddish, the dorsal furrow black, the saddle on which the shell rests whitish. In front, a broader medial and two narrower lateral black lines, the latter running to the tentacles. The sole pale brown.

The genus *Panda* is the most handsome, and from its relations with the Madagascar *Helicophanta*, one of the most interesting groups, of the Australian fauna. Revising the genus some years ago,* I reduced the species to three, *P. falconeri* Gray, *P. atomata*

* Hedley, Rec. Austr. Mus., ii., 1892, p.29.

Gray, and *P. larreyi* Brazier. The discovery of another species is the most important feature of Mr. S. W. Jackson's collection.

In this species, the genus reaches its most northern extension. In colour and texture it recalls *P. larreyi*, but from that, as from the others, it differs greatly by the auriculate form, few whorls, low spire and large aperture. In these respects, it curiously approaches *Helicophanta*. The novelty is the smallest of the genus.

At Mr. Jackson's wish, this interesting species is named in honour of Mr. Henry L. White, of Belltrees, near Scone, N. S. Wales, the well known ornithologist.

THERSITES DUNKIENSIS Forbes.

Helix dunkiensis Forbes, Voy. Rattlesnake, ii., 1852, p.378, Pl.ii., f.7a, b.

Helix coxeae Brazier, Proc. Zool. Soc., 1875, p.32, Pl.iv., f.5.

Helix nicomede Brazier, Proc. Linn. Soc. N. S. Wales, iii., 1878, p.79, Pl.viii., f.6.

(Plate iv., figs.5, 6, 7, 8.)

The types of Brazier's two species are in the Australian Museum; their author admitted to me that both should be subordinated to *T. dunkiensis*. Hitherto this species has only been recorded from the coast and islands of Rockingham Bay. Mr. Jackson has extended its range inland, by finding it (1) on the Herberton Range, at a height of nearly 4,000 feet, alive under stones in forest, and often burrowing 2 and 3 inches into the dry ground, November, 1908: (2) between Tolga and Rocky Creek, south-west of Cairns, at a height of 2,360 feet, in dry forest-country, alive under logs on stony ground, in company with *X. pachystyla*, December, 1908: (3) the Tinaroo forests from whence came the specimen here figured.

A harsh surface of grains and wrinkles constitutes a recognition-mark for this species. But this superficial sculpture varies considerably, the inland shells taken by Mr. Jackson being rougher than those from the coast. A corresponding but fainter sculpture occurs in *T. bipartita* Deshayes, and its variety, *T.*

webbi Pilsbry,* which immediately succeeds *T. dunkiensis* northwards. Indeed, another variety, *H. funiculata* Pfr., from Torres Straits, is not always easy to separate from *T. dunkiensis*.

CHLORITIS JACKSONI, sp.nov.

(Plate v., figs.13, 14, 15, 16.)

Shell of moderate size, depressed turbinate, perforate, very thin. Colour uniform burnt umber. Whorls four, rounded, parted by deeply impressed sutures, last a little broadened. Spire elevated, periphery rounded. Sculpture(fig.16): first whorl and a half coarsely granulate, subsequent whorls with numerous small, rather irregular riblets, which continue with a backward sweep from the suture to the umbilicus. Upon these and their interstices are very small and scattered hairs, easily denuded, and so visible only on fresh specimens. Aperture simple, lip thin, scarcely reflected except near the umbilicus, the margins united by a thin sheet of callus. Umbilicus narrow, rather oblique. Major diam., 13·5; min. diam., 10; height, 8 mm.

This species may be distinguished by the coarsely grained apex, followed by the fine radial ribbing. *Helix pliculosa* Pfr., which I have not seen, would, from the description, appear to resemble this.

Hab.—Mr. Sidney W. Jackson, to whom I have the pleasure of dedicating this species, found numerous specimens under logs in Ironbark forest-country, at Tolga, south-west of Cairns, in December, 1908.

CHLORITIS INFLECTA, sp.nov.

(Plate iv., figs.9, 10, 11; Plate v., fig.12.)

Shell of moderate size, rather solid, globose-turbinate, imperforate. Colour: cinnamon on the spire darkening to chestnut on the last whorl, the reflected lip buff. Whorls four and a half, rounded, separated by deeply impressed sutures, last suddenly and considerably descending at the mouth. Spire elevated, periphery rounded, base inflated. Sculpture: the first whorl and

* Pilsbry, Proc. Acad. Nat. Sci. Philad., 1899, p.473.

a half finely and densely grained, the remainder of the shell has microscopic growth-lines. Over all the shell are small, short, spaced bristles set in radial and oblique lines; between them the surface is minutely shagreened. Behind the lip, the last whorl is suddenly but tightly contracted, the contraction, open above, narrowing as it descends till, on the base, it ends in a groove running beneath the lip into the axis. Aperture ovate-lunate, very oblique, lip thickened and broadly reflected, left insertion spread, right attenuated, margins connected with a thin sheet of callus advanced beyond the axis. Major diam., 15; minor diam., 12; height, 10 mm.

Hab.— A few specimens were discovered by Mr. S. W. Jackson, in November and December, 1908, in Tinaroo scrubs, south-west of Cairns.

CHLORITIS COGNATA Gude, var. PRÆCURSORIS, var.nov.

(Plate v., figs. 17, 18, 19.)

This form agrees with the type of *C. cognata* Gude,* with which, through the kindness of Dr. J. C. Cox, I have compared it, in size, shape, substance and the disposition of the hair-scars. It differs by a very narrow umbilicus, oblique, and a third covered by the reflection of the columella. It also differs by the colour which is ochreous-buff darkening to rufous behind the aperture and on the base.

Mr. Jackson found it nearly two hundred miles north of Olsen's Caves, where Mr. C. T. Musson took the type of *C. cognata*. Var. *præcursoris* inhabits the upper valley of the Pioneer River. The example drawn was " found alive in dense, tall, tropical scrub, Eungella cutting, Eungella Mountain, west of Finch Hatton, Mackay District, August, 1908."

C. aridorum Cox, is rather similar, but has a more open umbilicus, the hair-scars(fig. 23) more distant and prominent, and half a whorl less.

As the existing figures of *C. aridorum* are not satisfactory, others(Plate vi., figs. 20, 21, 22, 23) are here presented, based on

* Gude, Proc. Malac. Soc. vii., 1907, p. 231, Pl. xxi., f. 5.

an authentic specimen from North Brisbane, whose height is 8, major diam. 11, and min. diam. 8·5 mm. The statement that *C. aridorum* ranges as far north as Fitzroy Island* appears, now that specific lines are drawn narrower, to need confirmation. The Frankland Island specimens, to which he refers, correspond with the type of *C. cognata* in size, shape, colour and texture, but *C. cognata* has finer and denser hair-scars, and the Frankland shell has coarser radial riblets.

PLANISPIRA RUDIS, sp.nov.

(Plate vi, figs.24, 25, 26, 27.)

Shell large, solid, rough, dinted, umbilicate, carinate, spire slightly raised, flat above, rounded below. Colour uniform russet or tawny olive, within the aperture white to purple. Whorls five, slightly irregularly undulating, so that an inner whorl is here raised above, and there level with the next. Above, the whorls are nearly horizontal, below ventricose. The periphery is pinched into a sharp keel, which projects from the earlier whorls continuously to within a short distance of the aperture, where it is less acute. The last whorl finally makes a slight descent. There is no crest behind the aperture. Sculpture: rough, irregular growth-lines are obliquely crossed by coarse vermiculate rugæ, merging into grains above and fine epidermal puckers below. Aperture trapezoidal, lip very little thickened, broadly reflected at the left insertion, very little on the base, and not at all above, a thin glaze over the preceding whorl. Umbilicus narrow, a sixth of the diameter, steep-sided and exhibiting all earlier whorls. Major diam., 29; min. diam., 23; height, 10 mm.

The flat form and sharp keel readily distinguish this and *P. delicata* from the typical round-whorled members of the group, such as *P. delessertiana*.

Hab.—A few specimens found by Mr. S. W. Jackson, in November and December, 1908, in Tinaroo Scrub, south-west of Cairns; and first, in the Johnstone River scrubs, early in October, 1908.

* Brazier, Journ. of Conch., i., 1877, p.270.

PLANISPIRA DELICATA, sp.nov.

(Plate vi., figs.28, 29, 30, 31.)

Shell of moderate size, very thin lenticular, carinate, perforate. Colour cinnamon with chocolate on the umbilicus, along the suture and around the aperture. Whorls four, rather rapidly increasing, evenly wound, the last developing an obscure crest and slightly descending at the aperture. Keel acute, continuous, margining the suture of the spire. Sculpture: faint, irregular growth-lines over-ridden above and below by fine delicate shagreen; initial whorls radiately striated. Aperture rhomboidal, lip thin, scarcely reflected except at the base. Umbilicus narrow, partly concealed by the reflected lip. Major diam., 14; min. diam., 12; height, 6 mm.

Hab. A single dead shell was taken, under leaves, on the ground, at Belson's Scrub, Atherton, on November 21st, 1908 by Mr. Jackson.

PLANISPIRA LEUCOCHEILA Cox, var. PUSILLA, var.nov.

(Plate vii., figs.32, 33, 34, 35.)

Helix maria Cox, Proc. Zool. Soc., 1864, p.594 (not *Helix maria* Gray, in Dieffenbach's New Zealand, ii., 1843, p.262); *Helix leucocheilus* Cox, *nom. mut.*, Monogr. Austr. Land Shells, 1868, p.54, Pl. viii., f.7*a*, *b*, *c*; *Helix yatalaensis* Cox, Proc. Zool. Soc., 1873, p.149, pl.16, f.3*a*, *b*.

A northern variety corresponding to the typical form from the Clarence River in shape and sculpture, but differs by having half a whorl less, and by being proportionately smaller. The peripheral brown line is maintained, but the coloured zone around the umbilicus disappears in the variety, while the depressed space between the crest and the lip may either be coloured like the rest of the shell, or may be chocolate passing into black. The original of my figures is maj. diam., 10·5; min. diam., 8·5; height, 6 mm.

Hab.—Mr. Jackson found it to be rare in the Tinaroo scrubs, south-west of Cairns, in November, 1908.

Microcystis rustica Pfeiffer.

(Plate viii., fig.42.)

Helix inconspicua Forbes, Voy. Rattlesnake, ii., 1852, p.379, Pl.ii., f.3*a*, *b*, *c* (not *Helix inconspicua* C. B. Adams, Contrib. Conch., iii, 1849, p.37); *Helix rustica* Pfeiffer, *nom. mut.*, Zeit. für Malak., ix., July, 1852, p.112; *Helix impexa* Reeve, *nom. mut.*, Conch. Icon., x., Oct. 1852, Pl.cxxx., f.795; *Helix crotali* Cox, *nom. mut.*, Cat. Austr. Land Shells, 1864, p.18; *Helix villaris* Reeve, Conch. Icon., x., Sept. 1854, pl.cxcv., f.1375; *Id.*, Pfeiffer, Proc. Zool. Soc., 1854,(April 11th, 1855) p.146.

The group of Queensland land-shells to which this species belongs, has been overloaded with names, and yet poorly differentiated. Von Martens formed, for it, a group, *Thalassia*, with *Helix subrugata* Pfr., for its type. This name was already occupied in birds, so Gude has substituted *Nitor*.* The genus *Fretum* Sykes,† appears to be near akin. The generic position must depend on structural details not yet ascertained.

In adult *M. rustica*, the left lip near its intersection is thickened, expanded, and bent down over part of the umbilicus (Plate viii., fig.42). Guided by this feature, the species should arrive at the genus *Microcystina*. But this character gradually disappears in related species; thus, in *M. kreffti*, the columella springs more vertically from the insertion, but the fold of *M. rustica* is represented by a thickening and a slight insinuation. In other, especially in thinner species, the columella is as in the immature *M. rustica*. Discarding, as unstable, the character of the guttered columella, I have referred the species to *Microcystis*.

From an island in Trinity Bay, near Cairns, Forbes figured and described the first known Australian species. Unfortunately he selected, for it, a name already used for a West Indian snail by C. B. Adams. Pfeiffer, Reeve, and Cox, each in turn offered a new name in correction of the error. But Pfeiffer, only knowing the species by name, and receiving it from the same collector

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* Gude, Proc. Malac. Soc., ix., 1911, p.270.

† Sykes, Proc. Malac. Soc., iv., 1900, p.140.

and the same district, proposed to call it *Helix villaris*. Reeve not only adopted this name, but anticipated Pfeiffer's publication of it by seven months.

A South Australian form, *Thalassia cyrtochila* Gude,* was identified with *M. rustica* by Angas and Tate.† It has the same general appearance, but differs in detail by having a wider umbilicus, not spirally striated within, not overhung by a bent columella, and by having a whorl less.

To the north, *M. rustica* is succeeded by *M. kreffti* Cox,‡ darker in colour, twice the diameter and with a straighter columella. This seems to merge into a banded variety occurring in New Guinea and some of the Torres Straits Islands, which Brazier has described as *Helix annulus*, and Tapparone Canefri§ as *Nanina orbiculum*.

From Port Moresby, in New Guinea, Petterd has doubtfully recorded *M. rustica*.‖

Helix yorkensis Pfeiffer, is distinguished by the subangled periphery and delicate striæ.¶

South of the tropics are two novelties here described. Still further south is *M. ductilis* Pfeiffer,** from the Drayton Range, with which I am not acquainted. Also *M. subrugata* Pfeiffer, of which *moretonensis* Pfr., *pudibunda* Cox, and *Clarencensis* Cox, seem to me to be slight varieties.

Mr. S. W. Jackson found *M. rustica* under logs, in an Ironbark forest, at Tolga, south-west of Cairns; also a small dark variety under leaves, in dry dwarf scrub, at the Botanic Gardens, Bowen.

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* Gude, Journ. Malac., xii., 1895, p.12, Pl.iii., f.2.

† Angas, Proc. Zool. Soc., 1863, p.521; Tate, Trans. Austr. Assoc. Adv. Sci., i., 1889, p.336; and Trans. Roy. Soc. S.A., xxiii., 1899, p.248.

‡ Cox, Monogr. Aust. Land Shells, 1868, p.2, Pl.x., f.8, as *H. villaris* Pfr.

§ Brazier, Proc. Linn. Soc. N. S. Wales, i., 1876, p.100; Tapparone Canefri, Ann. Mus. Gen., xix., 1883, p.204, Pl.v., f.16-18.

‖ Petterd, Journ. of Conch., i., 1878, p 396.

¶ Pfeifier, Conch. Cab., 2nd Ed., Helix, p.561, Pl.167, f.13-15.

** Cox, Monogr. Austr. Land Shells, 1868, p.10, Pl.xix., f.5.

MICROCYSTIS RESPONSIVUS, sp.nov.

(Plate vii., figs.36, 37, 38.)

Shell small, thin, smooth, glossy, subdiscoidal, spire slightly elevated, periphery rounded, base flattened, narrowly umbilicate. Whorls four, gradually increasing, flattened and margined at the suture. Colour amber, paler on the base, a dark line along the suture. Sculpture: on the smooth surface, growth-lines appear at irregular intervals; and faint, close, spiral lines are detected with difficulty. Aperture oblique, ovate-lunate; a thin callus unites the margins. Columella angled and thickened. From the angle, a keel winds into the umbilicus, which is narrow, largely obstructed by the penultimate whorl, and spirally grooved. Height 3; maj. diam., 6; min. diam., 5 mm.

Compared with *M. rustica* Pfeiffer, the new shell is smaller and proportionately flatter. In a good light and under high magnification, fine, spiral, engraved lines appear on *M. responsivus*, but not on *M. rustica*.

Tryon has reported *Nanina marmorata* Cox, from Port Curtis,* but, as that species does not range so far north, I suppose that he mistook *M. responsivus* for it. *Microcystis marmorata* Cox, has, indeed, a general resemblance to *M. responsivus*, but differs by being larger, paler in colour, having a more elevated spire, and especially by having the periphery keeled.

Hab.—Mr. Jackson found a few specimens, under fallen leaves, on the ground, in the Bottle Tree Scrub, west of Gladstone, Port Curtis, in August, 1908(type-locality). He found another specimen under leaves, on the ground, at the Coolabunia Pine Scrub in June. Dr. T. L. Bancroft has sent me a specimen from Eidsvold. It was collected, many years ago, at Gayndah, by Mr. G. Masters.

MICROCYSTIS INSCENSA, sp.nov.

(Plate vii., figs.39, 40; Plate viii., fig.41.)

Animal yellowish cream-colour(S.W.J.).

Shell globose-turbinate, perforate, thin, glossy, translucent, spire elevate, periphery rounded, base ventricose. Colour olive-

* Tryon, Man. Conch., ii., 1886, p.105.

buff, uniform or with darker and lighter radial streaks. Whorls five, rounded, parted by impressed and margined sutures, all gradually descending, so that the older shells are taller, in proportion to their diameter, than the younger. A thin epidermis, apt to peel off in patches. Sculpture: on the upper whorls are faint, close, spiral, incised lines which gradually disappear; the later whorls are traversed by irregular growth-lines. Aperture ovate-lunate, oblique; lip simple, thin; columellar margin a little thickened, expanded over part of the umbilicus, but not insinuate. A thin callus with shagreened surface is spread over the preceding whorl. Umbilicus narrow, spiral. Height, 7; maj. diam., 10; min. diam., 9 mm.

This species is distinguished from Australian co-generic forms by being more globose. It was found by Mr. S. W. Jackson, associated with *Flammulina delta* Pfeiffer, climbing the trunks of trees, *Araucaria Cunninghamii*, etc., in the pine scrubs of Coolabunia, in June, 1908.

Sitala turriculata Cox.

Helix (Conulus) turriculata Cox, Monogr. Austr. Land Shells, 1868, p.8, Pl. viii., f.11.

(Plate viii., figs.43, 44, 45.)

To aid the descrimination of this species, I add figures of an example from Miriam Vale, the type-locality, which measures: height, 3·75; maj. diam., 3; min. diam., 2·9 mm. This size is exceeded by other specimens before me. Southern shells appear to be a little larger, and less sharply keeled than northern specimens. Its range over North Queensland appears to be pretty general, for Brazier reported it from Fitzroy and Barnard Islands, and Musson from Cania. It was also taken near Bundaberg, by Dr. T. May; near Cooktown, by Mr. A. Dean; near Cardwell, by Lieut. C. E. Beddome; and at the Barron Falls by myself.

Mr. Jackson found several specimens under logs, in forest-country, at Evelyn, near Herberton, Herberton Range, in November, 1908, and another in the Tinaroo scrubs.

While on the subject of Sitala, I might mention that *S. pudica* Gude,* from Cape Byron, N.S.W., appears to me to be identical with *Helix russelli* Brazier.† The presence of this tropical beach-species so far south, is probably due to the influence of the Notonectian Current.

Flammulina corticicola Cox.

(Plate viii., figs.46, 47, 48.)

Helix corticicola Cox, Proc. Zool. Soc. 1866, p.374; Monogr. Austr. Land Shells, 1868, p.19, Pl.vii., f.7.

This species has not hitherto been reported from Queensland. It has been described and figured as "rather widely umbilicate." But specimens from Lismore, the original locality, kindly lent to me by Dr. Cox, show it, on the contrary, to be narrowly perforate, though the base is excavate round the umbilicus. I have, therefore, figured one of Mr. Jackson's specimens which is maj. diam., 6·5; min. diam., 5·5; height, 3 mm.

Hab. – Several specimens from Pine Creek Scrub, near Canungera, at the foot of Tambourne Mountain, July, 1908(S.W.J.). An example from under leaves, Bottle-tree Scrub, west of Gladstone.

Endodonta iuloidea Forbes, var. curtisiana, var.nov.

(Plate ix., figs.49, 50, 51.)

Helix iuloidea Forbes, Voy. Rattlesnake, ii., 1852, p.379, Pl.ii., f.3*a*, *b*, *c*; *Id.*, Reeve, Conch. Icon., x., Dec., 1854, Pl.ccvii., f.1464.

The genus *Endodonta* includes a number of species difficult to distinguish, especially on casual examination or without magnification. First of this genus to be reported from Queensland was *Helix iuloidea*, taken from under a stone at Port Molle, in Whitsunday Passage. This was introduced with a brief description and small figures. Though Reeve afterwards presented a larger, coloured illustration, readers failed to distinguish between this and related forms.

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*Gude, Malac., xii., 1905, p.11, Pl.iii., f.3.

† Brazier, Proc. Zool. Soc., 1874, p.668, Pl.lxxxiii., f.13, 14.

Thus Angas* thought he recognised the species from South Australia, where it does not occur. Tate and Tenison-Woods made a similar error in Victoria, the former attaching the name to *E. funerea* Cox, the latter to *E. albanensis* Cox.

Rehabilitation of this, the first described, must be the starting point in the identification of the other Queensland members of the genus.

Accordingly, I forwarded examples of a shell collected in the Gladstone district by Mr. Jackson, to the British Museum, and requested Mr. E. A. Smith to compare it with Forbes' type. With his usual kindness he did so, and replied 6/1/11 :—"We have the types (two specimens) of *H. iuloidea* Forbes, received from the Museum of Economic Zoology. In comparison, your shells are extremely similar. I think, however, the thread-like growth-lines in yours are rather closer together, or in other words more numerous. Then the umbilicus is slightly more contracted in yours, and the body-whorl consequently the least trifle higher. Our two shells do not exhibit any red markings like yours. Altogether, I am inclined to consider your specimens as a variety, not having enough material to come to any definite conclusion as to their being distinct."

Figures and a description, more elaborate than those of Forbes, are now presented, of the individuals examined by Mr. Smith, and which I propose to call var. *curtisiana*.

Shell thin, discoidal, broadly umbilicate, spire concave, but barely so. Colour : protoconch slate-grey, remainder tawny olive on which are disposed rusty flames, which are fairly regular, their breadth apart, extending over two or three lamellæ, but striking backwards and forwards across their course and continuing upon the base. Protoconch well defined, smooth, two-whorled, the initial inclined. Including these, the whorls are four and a half, rounded, parted by deeply impressed sutures, wound regularly, last not descending. Sculpture : adult shell traversed from suture to umbilicus by regular, delicate, erect lamellæ, of which the last whorl carries about one hundred; towards the aperture,

* Angas, Proc. Zool. Soc., 1863, p.521.

these are more crowded, but on the earlier whorls more spaced. Under high magnification, the inter-lamellate spaces are seen to be reticulated by very fine spiral and radial striæ. Aperture lunate, lip simple, thin, a slight glaze advanced on the body-whorl. Umbilicus one-third of the diameter, exposing the previous whorls, basin-shaped, steep-sided, broad-based. Height, 2·6; maj. diam., 5·5; min. diam., 4·2 mm.

The original of this description was found by Mr. Jackson, in August, 1908, under a log in the forest, just outside Springs Scrub, Mount Larcombe, Port Curtis. From other material, I find that it is common in the Port Curtis district, and ranges thence south to Brisbane.

ENDODONTA AUSTERA, sp.nov.

(Plate ix., figs.52, 53, 54.)

Shell small, thin, discoidal, spire slightly sunk below the vertex. Whorls four and a half, well rounded, parted by deeply impressed sutures, last half whorl slowly and gradually descending to about one-quarter of the depth of the penultimate. Colour: various shades of uniform brown, from dark chocolate to pale cinnamon, the apex sometimes uniform with the rest of the shell, sometimes slate-purple. Sculpture: apex smooth, subsequent whorls crossed by delicate radial riblets, which become regularly closer as growth proceeds; on the last whorl, there are about one hundred and thirty riblets, while the preceding whorl carries about half as many; fine radial and spiral scratches ornament the interstices of the riblets. Aperture lunate, lip simple, callus on preceding whorl thin, not concealing the riblets. Umbilicus about one-quarter of the shell's diameter, steep-sided, exposing previous whorls. Height, 2; maj. diam., 3·65; min. diam., 3·1 mm.

Hab.—Under logs in the forest, near Logan Village(type), and at Pine Creek Scrub, near Canungera, South Queensland; numerous specimens.

This appears to be one of the common species round Moreton Bay. It is one of several which have been confused by collectors with *E. iuloidea* Forbes. The novelty is darker, smaller, flatter, and more densely ribbed than that species.

ENDODONTA CINNAMEA, sp.nov.

(Plate ix., figs.55, 56; Plate x., fig.57.)

Shell discoidal, widely umbilicate, spire slightly sunk, very glossy. Colour: various shades of uniform brown, russet or cinnamon, prevailing, paler in the centre. Whorls four and one-half, well rounded, parted by deeply impressed sutures, the last slightly descending. Sculpture: rather straight, erect, radial lamellæ disposed at the rate of about one hundred to a whorl, but more crowded on the last half-whorl, interstices cancellate by microscopic spiral and fainter radial hair-lines. Several ribs before the aperture are buried in callus. Umbilicus deep, about one-third of the shell's diameter broad, exposing all previous whorls. Aperture lunate, lip simple. Height, 2·6; min. diam., 4·35; maj. diam., 5·3 mm.

Hab.—Several specimens found under large rocks in forest, Bell Bird, Coolabunia, Kingaroy, by Mr. S. W. Jackson, in July, 1908. I have also seen it from Beaudesert.

ENDODONTA RECAVA, sp.nov.

(Plate x., figs.58, 59, 60.)

Shell unsymmetrically biconcave, forming a saucer above, and a basin below. Whorls five, well rounded, divided by deeply impressed sutures, the last half-whorl gradually descending to nearly half-way down the penultimate. The crown of the shell is thus formed by the latter part of the penultimate, and the former part of the final whorls. Colour buff, irregularly radially striped with chocolate, stripes and interstices of equal breadth. Sculpture: the first half-whorl is occupied by a smooth and sharply defined protoconch; following this, for three-quarters of a whorl, are fine, close, radial threads. To this succeeds the adult sculpture of sharp and prominent lamellæ, which cross the whorls evenly and regularly, penetrating the umbilicus. Above and below they are slightly sinuate. On the last half-whorl they are more crowded than above. About one hundred ribs are set on the last whorl. Between the ribs, the surface is microscopically sculptured with fine, radial hair-lines. In front of the

aperture, three or four ribs are buried in thick callus-glaze. Aperture lunate, margins simple. Umbilicus exposing all the previous whorls, deep, in breadth about one-half the diameter of the shell. Height, 2·6; maj. diam., 4·5; min. diam., 4 mm.

This species is related to *E. vinitincta* Cox, but it is smaller, more compressed, and has more whorls.

Hab.—A single specimen, from the scrub of Finch Hatton west of Port Mackay, 2nd September, 1908(S.W.J.).

PUPINA STRANGEI Pfeiffer.

Pupina strangei Cox, Monogr. Austr. Land Shells, 1868, p.103, Pl. xx., f.16, 16*a*; *Id.*, Hedley & Musson, Proc. Linn. Soc. N. S. Wales,(2), vii., 1892, p.561; *Id.*, Kobelt, Cyclophoridæ in Das Tierreich, 1902, p.305.

(Plate x., fig.61.)

The figures of this species are unsatisfactory, and so little known that Kobelt's recent monograph omits reference to them. Another illustration is, therefore, now supplied. *P. strangei* is almost a miniature of *P. bilinguis* Pfeiffer. This opportunity is taken of adding that *P. nitida* Brazier,* is identical with *P. bilinguis*. In both species, an arch of callus-cord, forming a segment of the circular lip, unites and outlines vertical shields which shelter the canals. The shell, of a clear hazel-brown, is so thin that, when empty, the pillar can be seen through the wall. The specimen drawn is 5 mm. long, and 2·5 mm. broad.

P. strangei seems to be rather common and widely distributed in South-east Queensland. It was taken by Mr. Jackson, in June, 1908, under leaves, on the ground, in the pine scrubs of Coolabunia and Kingaroy, south-west of Maryborough.

PUPINA TENUIS, sp.nov.

(Plate x., fig.62.)

Shell small, gibbous-oval, thin, so diaphanous that the whole axis is visible through the whorls of an empty shell, and the

* Brazier, Proc. Linn. Soc. N. S. Wales, xxvii., 1902, p.20, Pl.iii., f.37.

overlap of the whorls shows a false margin to the suture. Colour clear hazel. Whorls five, the upper very convex, the summit rather protuberant, the body-whorl flattened. Surface very smooth and glossy, in fresh specimens, but appears, in weathered examples, especially on the penultimate whorl, to be finely, obliquely striated. Aperture circular, lip thickened, canals protected by triangular tongues, as in *P. strangei*. Height, 6; breadth, 3 mm.

This species is like *P. strangei*, and may have been confused with it. But it has a different geographical distribution, is larger, broader in proportion, and less upright. For effective contrast, the drawings of the two here given are of the same magnification.

Mr. Jackson found it associated with *P. robusta* Cox, in August, 1908, under leaves, on the ground, in the Bottle-tree-scrub, west of Gladstone, Port Curtis.

EXPLANATION OF PLATES IV.-X.

Plate iv.

Figs. 1,2,3,4.—Shell, apex, and animal of *Panda whitei* Hedley.
Figs. 5,6,7,8.—Shell and enlarged sculpture of *Thersites dunkiensis* Forbes.
Figs. 9,10,11.—Shell and enlarged sculpture of *Chloritis inflecta* Hedley.

Plate v.

Fig. 12.—Shell of *Chloritis inflecta* Hedley.
Figs. 13,14,15,16.—Shell and enlarged sculpture of *Chloritis jacksoni* Hedley.
Figs. 17,18,19.—Shell of *Chloritis cognata* Gude, var. *præcursoris* Hedley.

Plate vi.

Figs. 20,21,22,23.—Shell and enlarged sculpture of *Chloritis aridorum* Cox.
Figs. 24,25,26,27.—Shell and enlarged sculpture of *Planispira rudis* Hedley.
Figs. 28,29,30,31.—Shell and enlarged sculpture of *Planispira delicata* Hedley.

Plate vii.

Figs. 32,33,34,35.—Shell and enlarged sculpture of *Planispira leucocheila* Cox, var. *pusilla* Hedley.
Figs. 36,37,38.—Shell of *Microcystis responsivus* Hedley.
Figs. 39,40.—Shell of *Microcystis inscensa* Hedley.

Plate viii.

Fig. 41.—Shell of *Microcystis inscensa* Hedley.
Fig. 42.—Base of shell of *Microcystis rustica* Pfeiffer.
Figs. 43,44,45.—Shell of *Sitala turricnlata* Cox.
Figs. 46,47,48.—Shell of *Flammulina corticicola* Cox.

Plate ix.

Figs. 49,50,51.—Shell of *Endodonta inloidea* Forbes, var. *curtisiana* Hedley.
Figs. 52,53,54.—Shell of *Endodonta austera* Hedley.
Figs. 55,56.—Shell of *Endodonta cinnamea* Hedley.

Plate x.

Fig. 57.—Shell of *Endodonta cinnamea* Hedley.
Figs. 58,59,60.—Shell of *Endodonta recava* Hedley.
Fig. 61.—Shell of *Pupina strangei* Pfeiffer.
Fig. 62.—Shell of *Pupina tennis* Hedley.